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ABSTRACT

The Myers-Briggs Type Indicator (MBTI) Extraversion-Introversion scale was compared with the Minnesota Multiphasic Personality Inventory (MMPI) 0 scale (Social Introversion) for 18 male and 66 female adult students in introductory courses in psychology, aged 17 to 83 years. A status survey design was used with a priori and post hoc groupings. Independent variables investigated were age, gender, and marital status. Dependent variables were the MBTI Extraversion-Introversion scale and the MMPI 0 scale scores. An analysis of variance was used to test the null hypotheses. Results suggest the following: (1) age and marital status should be investigated simultaneously when using the MMPI 0 scale scores; (2) an association is found between MBTI extraversion-introversion scores and the MMPI 0 score; (3) no association is found for age and the MBTI scores studied; (4) no association is found for gender and the MBTI scale scores studied; (5) no association is found between gender and MMPI 0 scale; (6) no association is found between marital status and MBTI scores studied; and (7) the two scales of the instruments studied appear to give approximately the same information. An appendix contains the authorization to use the case materials in research, teaching, or publishing. Three tables and one figure present study findings. (Contains 43 references.) (SLD)

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A COMPARISON OF THE MYERS-BRIGGS TYPE INDICATOR EXTRAVERSION-INTROVERSION SCALE, AND THE MINNESOTA MULTIPHASIC PERSONALITY INVENTORY 0 SCALE (SOCIAL INTROVERSION)

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A Thesis Presented to the Graduate Faculty
of the Fort Hays State University in
Partial Fulfillment of the Requirements for
the Degree of Master of Science

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Graduate Committee Approval

The Graduate Committee of Micheal R. McVay hereby approves his thesis as meeting parital fulfillment of the requirements for the Master of Science degree at Fort Hays State University.

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Abstract

The purpose of the researcher was to compare the Myers-Briggs Type Indicator (MBTI) Extraversion-Introversion scale and the Minnesota Multiphasic Personality Inventory (MMPI) 0 Scale (Social Introversion). The subjects were students enrolled in 6 introductory courses in psychology at 2 adult education outreach centers in Northwest Kansas during Spring, Summer and Fall semesters from 1990 to 1992. The sample consisted of 84 students, of which 18 were male and 66 were female. Ages varied from 17 to 83 years old. The two instruments employed were the MBTI and the MMPI. A status survey design was employed with predetermined and post hoc groupings. The independent variables investigated were: age, gender, and marital status. The dependent variables employed were MBTI Extraversion-Introversion Scale scores and MMPI 0 Scale (Social Introversion) scores. Two composite null hypotheses were tested employing three-way analysis of variance, general linear model. One null hypothesis was tested employing a t-test. Two comparisions were statistically significant at the .05 level. One comparison was for the interaction between age and marital status for the dependent variable MMPI 0 Scale (Social Introversion). The second comparison was for a t-test which generated a correlation coefficient

of .63. This replicated a previous study conducted by Strickler and Ross (1964.)

The results of the present study appeared to support the following generalizations:

1. age and marital status should be examined simultaneously when employing Minnesota Multiphasic Personality Inventory Scale 0 (Social Introversion) scores
2. an association was found between Myers-Briggs Type Indicator Extraversion-Introversion scores and Minnesota Multiphasic Personality Inventory Scale 0 (Social Introversion) scores
3. no association was found between age and Myers-Briggs Type Indicator Extraversion-Introversion scores
4. no association was found between gender and Myers-Briggs Type Indicator Extraversion-Introversion Scale scores
5. No association was found between gender and Minnesota Multiphasic Personality Inventory 0 Scale (Social Introversion) scores
6. no association was found between marital status and Myers-Briggs Type Indicator Extraversion-Introversion scale scores
7. the two instruments, Myers-Briggs Type Indicator Extraversion-Introversion scale and Minnesota

x

Multiphasic Personality Inventory O Scale (Social Introversion) scale, appear to give approximately the same information.

Introduction

Overview

Personality Types. Those who have conceptualized personality as types or styles from the beginning of recorded history attempted to categorize the ways human beings behaved. Not every one agrees as to the meaning of personality types or styles.

Centuries ago the Greek philosopher Hippocrates suggested the existence of four temperaments: Sanguine, Choleric, Phelgmatic, and Melancholic. People with the Sanguine temperament were seen to prefer others like themselves because they preferred freedom, optimism, and spontaneity. People with the Choleric temperament were seen as quick-tempered, but tended to focus on self. People with the Phlegmatic temperament were seen as being calm, cool and striving for power. People with the Melancholic temperament were seen to hold self in high regard of social status (Evans, Benner, & Hayes, 1988).

Jung (1923, cited in Myers & Myers, 1980) focused on the personality and explained variations in human behavior by the way people preferred directing their psychological energy. This was termed by Jung as extraversive, energy directed outward, and introversive, energy directed inward. Lynch (1985) gave the following comparison of Jung's concepts of extraversion and introversion:

> Extraverts (Es) like variety and action; introverts (Is) like quiet for concentration. The Es tend to be faster and dislike complicated procedures, whereas Is tend not to mind working on one project for a long time without interruption. The Es are often good at greeting people and like having people around; the Is like to work contentedly alone and may often have difficulty remembering people's names and faces. Extraverts are interested in the results of their jobs, in getting it done, and in how other people do it. Introverts, on the other hand, are more interested in the idea behind the job. (p.106)

In addition to grouping people into two large groups, introversive and extraversive, Jung maintained that closer examination of individuals indicated that they also differed according to basic psychological functions (Myers & McCaulley, 1985.) Jung postulated that the extraversive type personality focused attention on external objects and was concerned with relations to other people. The introversive type personality focused on internal psychological processes, and was concerned with pursuing solitary activities (Jung, 1923, cited in Myers & Myers 1980).

Logan (1990) noted that those preparing to enter the counseling profession must examine the various instruments measuring a construct in order to comprehend

that construct.

> If a student counselor is to find an ideological peg on which to hang his or her hat, it is logical to explore as many alternatives as resources allow. In this exploration one should listen to what reservations are held by those who do not adhere to a given perspective and not simply accept blindly the claims of the proponents. (p.344)

Two of the scales developed to measure Jung's concept are the Myers-Briggs Type Indicator's Extraversion-Introversion Scale and the Minnesota Multiphasic Personality Inventory's 0 Scale (Social Introversion). This researcher will first review the Myers-Briggs Type Indicator and then the Minnesota Multiphasic Personality Inventory in light of Jung's concept of extraversion-introversion.

Myers-Briggs Type Indicator (MBTI)

Description. The Myers-Briggs Type Indicator (Form F) is composed of 114 forced choice personality preferences and 52 forced choice word pairs, for a total of 166 items. These preferences are presented in a test booklet. Subjects are given a test booklet and an answer sheet with instructions read to them. The MBTI yields continuous scores which are then determined to classify subjects on four preference scales (extraversion-

introversion, sensing-intuition, thinking-feeling, and judging-perceiving). The resulting preference scales are then differentiated to classify 16 personality types. The MBTI is not gender biased (Myers & Myers, 1980).

McCaulley (1990b) reported:

> Continuous scores are a linear transformation of Preference scores for convenience in statistical analysis. The convention is to set a midpoint at 100 and to add the numerical portion of the preference score if the preference is I, N, F, or P, or to subtract if the preference is E, S, T, or J. For example continuous scores for E 19 and I 19 are 81 and 119. It is important to understand that type theory assumes dichotomies, not normal or continuous distribution. (p.184)

Jung (1923 cited in Myers & Myers 1980) postulated that extraversion-introversion was fundamental to personality and that only the relative predominance of one or another determined the type. Hirsch and Kummerow (1989) described the MBTI as having carefully researched questions and word pairs which were arranged in a forced-choice format that asked one to choose between mutually viable options. The opposite ends of the four choices represented very different ways of looking at life. It

may be said that people have the capacity to choose either of the presented options. They may prefer one option over another, such as making a preference in writing with one hand instead of the other (Carlyn, 1977).

Myers and Myers (1980) described the MBTI: "The main purpose of the Indicator (i.e., MBTI) is to ascertain a person's basic preferences....What each scale is intended to reflect is a habitual choice between opposites analogous to right or left handedness" (p.2).

MBTI Usage. Counselors can use the results of the MBTI to describe individuals, groups, couples, and families. It can also be used with children, young people, and adults; for teaching individual development, for career counseling, and for communications training. Educators can use the instrument with teachers and students to work with type differences in teaching styles, learning styles, academic achievement and motivation, dropout, and college roommate matching. The review of the literature showed that organizations in business, industry, and government use the instrument to deal with type differences in communication, teamwork, management styles, and for lifelong planning (Moore, 1987, Murray, 1990). The religious community uses the MBTI to value type differences in spiritual development (Oswald & Kroeger, 1988).

The Myers-Briggs Type Indicator has become the most widely used personality instrument for non-psychiatric populations (Devito, 1985, Oswald & Kroeger, 1988). Oswald and Kroeger (1988) stated: "70% of people in the United States prefer the extraversion choice, while only 30% choose the introversion type" (p.21).

Moore (1987) stated:

> In 1986, some 1.5 million people took the MBTI, according to its publisher, Consulting Psychologists Press in Palo Alto, California. It is almost certainly the most wide used personality test in the U.S., and the test whose use is growing fastest. (p.74)

Murray (1990) noted: "The Myers Briggs Indicator has been introduced into many phases of education, business, and professions and its contributions to understanding effective teamwork and the various preferences involved in decision making have been welcomed" (p. 1198).

Dash (1990) maintained:

> The Myers-Briggs Type Indicator provides adults with self-confirming insights and helps make patterning of human behavior understandable and acceptable. These insights help people make choices, clarify skills, and make decisions affecting work and groups.... In the meantime the MBTI will continue to serve the business and industrial community and become a "basic

tool" of the Human Resource practitioner. (p.91)

Lynch (1985) gave additional information about the instrument's value for counselors:

> Not only does the MBTI provide an avenue for understanding self and clients, but also the instrument, its theory and research can assist counselors in gaining knowledge about careers and work settings. Perhaps the most important reason for using the Indicator is that it provides a way of appreciating human differences and enhancing the individual's self-esteem. (p. 104)

Dilley (1987) found the instrument to be beneficial to counselors in individual counseling:

> Counselors often give clients the MBTI and then provide them with descriptions of the various type and preference characteristics. Clients then can assess their preferences, sifting through the various options, and, with the counselor's help, determine for themselves what their innate preferences might be. Used in this way, the MBTI provides a vehicle for self-affirmation, understanding of strengths and weaknesses, and for developing a plan for self-development. (p.48)

Gordon and Carberry (1984) examined the instrument's use for career counseling:

> Developmental advising advocates that students are

> unique and progress through cognitive and interpersonal development at different paces. Instruments like the MBTI can provide a starting place from which the developmental advising process may progress. (p.77)

McCaully (1990a) addressed additional use of the instrument for counselors:

> The counselor needs to be alert for the danger that the client puts too much weight on the type and type description. This danger is greater with the MBTI than other instruments where a shift of T-scores from 49 to 55 does not have the significance that a shift of letters from E 7 to I 7 may have. (p.105)

Thompson and Borrello (1989) gave the following statement pertaining to use in vocational counseling. "The MBTI has proven useful in explaining diverse phenomena, including vocational choice and success in interpersonal relations" (p.6).

Development of the MBTI. In 1926, Katherine Briggs discovered Jung's book Psychological Types, and began a life long study of human behavior. Her daughter, Isabel Briggs-Myers, later joined in this study. McCaulley (1982, cited by Lawrence, 1982) described Brigg's work:

> The MBTI was developed slowly, thoroughly and carefully over the next twenty years. During this period she tested thousands of high school students

> and later telephoned hundreds of parents to discover the careers their children had chosen. She tested a sample of over five thousand medical students, following up four years later to determine which had fared well or poorly in medical school....Educational Testing Service (ETS) in Princeton, NJ, learned about Isabel Brigg's work from one of the medical schools and published the MBTI in 1962 after collecting additional data from a number of college students. When ETS published the indicator, it was intended for use strictly as a research tool for psychologists and other professionals interested in human behavior. (p.14)

In 1975, research had reached the point where the current publisher, Consulting Psychologists Press (CPP), published the MBTI for professional applications. In the years since then, its use has grown to the point where it is the most widely used psychological instrument for "normal people" (Devito, 1985).

Kirsey and Bates, 1984, stated:

> The history of the Myers-Briggs Type Indicator and the psychological constructs from which it was developed came from the theories of the late Dr. C.G. Jung. He claimed that human beings are basically alike in fundamental ways even though they all have the same multitude of instincts (archtypes) to drive

> them from within. One instinct is no more important than another. What is important is our preference for how we "function." Our preference for a given "function" is characteristic, and so we may be "typed" by this preference. Thus Jung invented the "function types" or "psychological types." (p.3)

The long process of creating the MBTI evolved by solving a series of technical difficulties. Myers and Briggs began by creating forced-choice questions that were intended to let people indicate the effects of Jungian preferences in their everyday life (McCaulley, 1990b).

Oswald and Kroeger (1988) found that: "The creation of the MBTI made possible decades of research on type which has produced vast amounts of information on the behavior and attitude of types in a wide variety of settings" (p.2).

Murray (1990) studied the use of the instrument and found:

> The inventory has served as a practical assessment Jung's theory and the Myers-Briggs Indicator provide interesting and provocative patterns that illuminate observations of individual differences in styles of gathering information and reaching decisions. (p.1199)

Types of MBTI Scores. Devito (1985) noted that:

> For each index, one obtains a raw score (points) for each polarity (e.g., E and I), a preference score which shows the strength of the polarity and eliminates any ties, and optionally, a continuous score along the E-I dimension. The continuous score is least emphasized in practice because it is a departure from type theory, yet it is this score that is most useful in evaluating the instrument's psychometric properties and analyzing research findings. (p.739)

Hicks (1984) detailed preference scores and their relationship to continuous scores:

> The MBTI yields either preference scores or continuous scores; these two kinds of scores have very different properties. The preference scores were devised to display scale bipolarity. There is no difference between a subject summed item weights from each of the ends of a bipolar scale.... To obtain a preference score, the smaller raw score is doubled, and then one point is added. This convention makes all MBTI scores assume odd values. (p.1121)

Carlyn (1977) described the scoring of the MBTI as if it had continuous scales and not as dichotomous scales.

> Continuous scores are all odd numbers ranging from

> 33 to 161 with 100 serving as the division point which separates the two opposing preferences.... Because distributions may be platykurtic, skewed, bimodal, or relatively normal, researchers should illustrate the frequency distributions obtained with a particular sample. (p.462)

Seventy-one of the items on the instrument were considered experimental and, according to the manual, (Myers & McCaulley, 1985) were intended for research. They were not employed to determine dichotomies (Cowan, 1989; Thompson & Borrello, 1986).

Carlyn (1977) assessed the results of the instrument and found that some researchers treated scores as dichotomous type categories and some treated scores as continuous data. "Although internal consistency studies usually produced acceptable reliabilities for both continuous and dichotomous scores, researchers should examine the internal consistency reliabilities of MBTI scores for a particular sample under study" (p.465).

Carlyn's (1977) assessment indicated that the scales of the instrument were relatively independent of each other. Myers and McCaulley (1985) postulated that researchers would expect sharp discontinuities occurring at the midpoint of each scale, but found some evidence of bimodality in score distribution. They reported

correlation coefficients between continuous scores on the scales with scales of personality and interest measures. "Some significant relationships occurred. In general, correlations were in the predicted directions, and MBTI scores did not correlate with measures of unrelated constructs" (pp. 177-206).

Hicks (1984) summarized the debate over continuous and dichotomous scores and reported, "MBTI continuous scores are more adaptable to statistical analysis, although sometimes at the cost of obscuring changes that occur at the scale midpoint when correlational analyses are used" (p.1121).

Hicks (1984) considered the MBTI to measure people's preferences as continuous choices. The forced choice format registers their preferences for one psychological trait, or psychological interest, over another trait. People's interests, motivations, and behaviors are preferences that tend to move along the continuous directions.

Criticisms of the MBTI. Criticisms have been registered since the MBTI was first published in 1962. The MBTI enables the user to classify responses of people into one of the 16 types based on Jung's hypothesized classification. Healey (1989) found that:

Today, evidence of the contribution of the 16 types

> to understanding people or enhancing therapy is at best modest. Moreover, reviews have questioned whether the four MBTI scales measure the constructs that Jung defined and there are no published studies showing that use of the scales in the manner suggested in the 1985 manual contributes to client growth. Consequently, there does not appear to be justification to administer and interpret the MBTI in counseling, except experimentally. (p.487)

Moore (1987) has stated "the Myers-Briggs stereotypes people, that it is static, undynamic theory that traffics in labels much like astrology, and may have dogged Jung's theory for years" (p.78). Cowan (1989) examined the MBTI in regards to its use by counselors and registered the following criticism:

> It is my opinion that the MBTI seems to be attracting too much current attention and, in doing so, has squelched attention to the underlying theoretical relationships themselves and to alternative measurement technologies. There is no obvious reason why the current status quo of this theory and its measurement cannot be improved. (p.470)

There has been some additional criticism of the use of the MBTI. Especially that assessments of only external

behavior probably cannot be sensitive enough to measure Jung's complicated theory and could sacrifice some of the theoretical richness of Jung's insights into the construct validity of the instrument (Cowan, 1989).

Carlson (1985) added this criticism of the instrument's validity:

> Validity of the MBTI remains in greater question than reliability. Although relationships between the Indicator and other tests have generally supported hypotheses concerning underlying theoretical overlap, five of the eight studies reviewed in the interest correlations section concentrated upon the EI scale of the instrument....
>
> ...
>
> Finally, while for construct validation a wide variety of research has clear utility, at the same time there has been a notable lack of systematic programs of research on the Indicator, such as has characterized, for instance, development of the MMPI. (p.364)

Carlson (1989) found that counselors and especially researchers have had a tendency to emphasize the Extraversion-Introversion scale which may have left the issue of validity less certain for the other MBTI scales. Jungian psychological type relies on choices

between extraversive or introversive attitudes, sensation or intuition, feeling or perceiving functions, to describe and differentiate categories of people according to the way they prefer to use their minds. Carlson maintained the MBTI did not measure personality traits but only registered preferences.

Murray (1990) found:

> Its indices of reliability and validity have been extensively investigated and have been judged acceptable. The constructs underlying the Myers-Briggs Indicator have been supported by correlations with other tests of personality, Extraversion-Introversion, and Emotionality as well as with behavioral correlates of the four scales in many professions and business organizations. (p.1199)

Hoover and Kadunc (1983) found that "ironically, the very construct which MBTI attempts to measure, psychological type, can serve to blur the actual internal consistency in terms of statistical reliability when the psychological type of the subject is developmentally undifferentiated" (p.2).

Other researchers have found criticism of the MBTI in regards to its construct validity. Tzeng, Outcalt, Boyer, Ware, and Landis (1984) added:

> However, all psychometric studies on the MBTI have

> been restricted at the scale (dimension) level. Since the utility of any personality inventory depends on the internal structures for the items for each measurement scale, the apparent lack of psychometric evidence for the MBTI items clearly suggests the necessity of this area of research. (p.256)

Strickler and Ross's (1964) research examined the problem that indirect measurement introduced extraneous sources of variance. A sequence of questions was posed:

> Do the underlying variables really exist? Is the Jungian system a set of true assertions about individuals, and hence are there typological distinctions among human beings? If the answer to the first question is negative, the second question becomes unreal, because it is: Do the measuring instruments validity reflect the underlying variables? In the present case, for example, since extraversion-introversion is measured by reported talkativeness and other such characteristics, it may be that the E-I scale is more responsive to other determinants of talkativeness than extraversion-introversion, per se. (p.642)

The position Strickler and Ross (1964) advanced was that the MBTI scales were strongly subjected to influences

other than the values that Myers and Briggs postulated.

> In any event, even if the typology that the Indicator is intended to reflect does exist, it would be premature to assume that the Indicator operationally defines it until (a) on the one hand, the alternative hypothesis about the scales meaning which are suggested by the findings reported in this article are tested and rejected: and (b) on the other, a body of findings accumulate which directly link each scale to its conceptual definition. (p.642)

Minnesota Multiphasic Personality Inventory (MMPI)

Description. The 1943 Group Form MMPI contains 566 items consisting of declarative statements yielding a true or false response as applied to the subject at the time the instrument was administered. The MMPI is available in the pencil and paper group form and also on a cassette tape version for persons unable to read.

The test yields clinical scales entitled; Scale 1 Hypochondriasis; Scale 2 Depression; Scale 3 Conversion Hysteria; Scale 4 Psychopathic Deviate; Scale 5 Masculinity-Femininity; Scale 6 Paranoia; Scale 7 Psychastenia; Scale 8 Schizophrenia; Scale 9 Hypomania; and Scale 0 Social Introversion (Hathaway & McKinley, 1982). Raw scores are converted into standard scores with a mean of 50 and a standard deviation of 10. Scores are

considered in the clinically significant range when they are elevated above T-70 or if they fall lower than T-45. A group of Minnesota normal people tested in the late 1930's and 1940's formed the group considered to reflect scores from T-45 to T-70. Marks, Seeman, and Haller (1974) noted that the Scale 0 (Social Introversion) was "the only clinical scale for which the criterion group was comprised of a non-psychiatric (normal) sample" (p. 31).

A study of normal individuals conducted in the late 1970's (Colligan, Osborne, Swenson, & Offord, 1983) indicated that the average person answered the MMPI differently than the average person did in the 1930's and 1940's. Graham (1977), Trimboli and Kilgore (1983), Duckworth and Anderson (1986) used these updated normative groups for comparison of T-scores in determining the code types that differentiate clinical scores from normal scores.

MMPI Usage. Since the 1943 publication of the MMPI, its use has been extended to a variety of settings, including employment agencies, university counseling centers, mental health clinics, schools, and industry. Duckworth (1990) also noted that the MMPI can be used in pain clinics, wellness centers, family counseling centers, vocational counseling centers, and with law enforcement centers. The MMPI's use also has been expanded to include research and screening.

Duckworth (1990) noted the advantages for counselors to understand and respect the MMPI's complexity:

> One of the main advantages of the MMPI was its ability to reflect the tremendous complexity of the individuals who were tested while at the same time allowed the individuals to be classified into some kind of diagnosis system. No other personality assessment instrument seemed to do this task as well as the MMPI. (p.33)

Development of the MMPI. The MMPI was developed by Starke Hathaway and J.C. McKinley in the late 1930's and published in 1943 as a complex psychological instrument designed to diagnose mental patients into different categories of neuroses and psychoses. As was previously mentioned, the original purpose of the MMPI was as an assessment instrument, primarily for assigning a diagnostic category to a client. Duckworth (1990) described how Hathaway and McKinley developed their instrument.

> They gathered a large number of items from psychiatric textbooks, other personality inventories, and clinical experience. After deleting duplicate items they had a sample of items that were then used to develop a number of scales to diagnose various types of psychoses and neuroses. (pp. 9-10)

Types of MMPI 0 Scale Scores. Drake (1956), Director of the Student Counseling Center at the University of Wisconsin, developed the O Scale (Social Introversion) employing a sample of 543 students of which 350 were female and 193 were male at the University of Wisconsin during the period from 1944 to 1945. "The derived key appears to have equally good validity for both male and female students" (Drake, 1956, p.183). Tzeng, et. al., (1984) studied 444 college students and clerical employees. For data analysis, three groups were formed, males, females, and both sexes. They found that no sex differences were observed on the Social Introversion scale. This research confirms Drake's (1956) original postulate that no sex bias existed.

Scale O (Social Introversion) consists of 70 items concerning uneasiness in social situations, insecurities, worries, and lack of social participation. The higher the scale score, the more the person preferred being by self; the lower the scale score the more the person sought social contacts.

Scale O measures personal autonomy, self-direction, and self-actualization. A high score (over T-70) indicates a tendency for people to withdraw from society. A low score (under T-45) indicates that a person is integrated into society (Graham, 1977).

Although Scale O was developed later than the other

clinical scales, it has come to be treated as a standard clinical scale (Graham 1977). Graham noted:

> The 70 items of this scale are of two general types. One group of items deals with social participation, whereas the other group deals with general neurotic maladjustment and self-depreciation. High scores can be obtained by endorsing either kind of item or both. (p.60)

Duckworth and Anderson (1986) noted that "College students with an elevation between T=60-70 tend to be more introverted than the typical college student, because the median score for college students is near a T of 45" (p. 230).

Persons with Scale 0 elevations of T=60 and greater prefer to be by themselves or with a few select friends. Graham (1977) described high scoring people.

> The most salient characteristic of high scores on scale 0 is social introversion. High scorers are very insecure and uncomfortable in social situations. They tend to be shy, reserved, timid, and retiring. They feel more comfortable when alone or with a few close friends, and they do not participate in many activities and may be uncomfortable around people. High scorers lack self-confidence, and they tend to

> be self-effacing. They are hard to get to know and are described by others as cold and distant. They are sensitive to what others think of them, and they are likely to be troubled by their lack of involvement with other people. (pp. 60-61)

The O scale (Social-Introversion) follows a similar construct as the MBTI's Extraversion-Introversion scale. McCaulley (1990a) found that the largest significant correlation coefficients between the MBTI Extraversion-Introversion Scale and the MMPI O Scale (Social Introversion) scale ranged from .69 to .79. (p.96)

MMPI Criticisms. Trimboli and Kilgore (1983) examined the MMPI from a psychodynamic approach and found, "There are other important dimensions of personality that are essential to assessing an individual, and we acknowledge that the MMPI is not sensitive to all of these" (p.625). Duckworth (1990) noted that updated normative groups must be used:

> The average person today is answering more items in the deviant direction than was true in the 1930's, perhaps reflecting a greater willingness to admit to problematic feelings and behaviors. It would seem, therefore, that caution is needed in interpreting MMPI scale scores that are borderline, that is, around 70 T-score points, because these scores may

> not be as "abnormal" as they once were....Because of the widespread use of the MMPI and the almost mystical belief by some people in its ability to diagnose people and their problems, caution must be exercised in order not to abuse the test. (p.16)

The instrument was revised in 1989 by eliminating outdated, offensive items, and reworded to eliminate ambiguity and sexist wording. Duckworth (1991), Caldwell (1991), and Graham (1991) noted some of the criticisms of the MMPI-2.

> The new norm group, albeit more representative of today's population, is still biased by being heavily weighted with professional people who have higher education than the general United States population ....As a final problem, some of the research scales that are helpful with people who have within-normal profiles are not available for the MMPI-2 test....I would urge the counselor or clinician to use the MMPI-2 cautiously, checking with the test taker whenever possible, to be sure that the interpretation based on the MMPI-2 profile is accurate for that individual. Until more data are available based on research with the MMPI-2, the test user must necessarily be tentative in interpreting this test. (Duckworth, 1991, p.566-567)

Caldwell (1991) responded to Duckworth's evaluation when he stated:

> "A central issue in Duckworth's critique and in the use of the MMPI-2 in general is the comparability of patterns between the two sets of norms and the applicability of existing MMPI code type interpretive material to MMPI-2 profiles" (p.567).

Graham (1991) responded to Duckworth's critique:

> One should not assume that, because on the very rare occasions when the MMPI-2 yields different code types from the MMPI, the MMPI-2 code types are less accurate representations of what test takers are really like. (p.571)

In light of these critques of the MMPI-2, this researcher chose to examine the original 1943 MMPI version. The wealth of more than 50 years of research and instrument usage was a primary consideration of utilizing this version for comparision to the MBTI.

A comparison study of the MBTI Extraversion-Introversion scale and the MMPI 0 Scale (Social Introversion).

Strickler and Ross (1964) did correlational studies between the MBTI Extraversion-Introversion scale and the MMPI Social Introversion scale. The instruments were administered to an entering freshman class of 254 male students at Wesleyan University. The results were

analyzed for the 225 students for whom complete data were available. Pearson product-moment correlation coefficients were calculated between the MBTI's continuous scales and the MMPI scales. "The Indicator had generally low but significant ($p < .05$) correlations with the MMPI clinical scales. One important exception was the E-I scale's correlation of .63 with an extraversion-introversion scale -- Si" (pp. 626-627).

Summary

The related literature defined extraversion-introversion employing 2 assessment instruments; the Myers-Briggs Type Indicator's Extraversion-Introversion Scale and the Minnesota Multiphasic Personality Inventory O Scale (Social Introversion) scale. Both instruments provided data to interpret peoples preference for extraversion-introversion. Jung's postulate that persons make extraversive and introversive preferences was found to differentiate people into differing psychological functions. The results from both instruments supported Jung's postulate.

Statement of the Problem

The purpose of the researcher was to compare the Myers-Briggs Type Indicator Extraversion-Introversion scale and the Minnesota Multiphasic Personality Inventory O Scale (Social Introversion).

Importance of the Research

One preparing to enter the counseling profession needs to comprehend extraversion and introversion and the scales employed to measure them. Each person displays extraversion or introversion to some degree. The factors that comprise an individual's preference regarding the psychological types are multidimensional and not clear.

This research was important because it generated new information concerning the Extraversion-Introversion scales of the Myers-Briggs Type Indicator and the 0 scale (Social Introversion) of the Minnesota Multiphasic Personality Inventory. More specifically, it allowed the researcher to compare the results from the two scales. Counselors in educational, business, religious, and mental health settings benefit from the results of determining clients extraversion-introversion preference by better understanding them.

In addition, the results from the present research provided information beyond that found in the literature that affect one's preference for Extraversion-Introversion. The research was important because it provided information about Extraversion-Introversion so other counselors could build upon these findings and make more clear-cut decisions in deciding which instrument, the Myers-Briggs Type Indicator or the Minnesota Multiphasic

Personality Inventory, to use in counseling.

The results of the present study presented information pertaining to the following questions:

1. Is there an association between age and MBTI Extraversion-Introversion scores?
2. Is there an association between age and MMPI Scale 0 scores?
3. Is there an association between gender and MBTI Extraversion-Introversion Scale scores?
4. Is there an association between gender and MMPI Scale 0 scores?
5. Is there an association between marital status and MBTI Extraversion-Introversion scores?
6. Is there an association between marital status and MMPI Scale 0 (Social Introversion) scores?
7. Is there an association between MBTI scores and MMPI scores?

Composite Null Hypotheses

All hypotheses were tested at the .05 level of significance.

1. The difference between mean Extraversion-Introversion scale scores of the Myers-Briggs Type Indicator according to age, gender, and marital status will not be statistically significant.

2. The difference between mean Scale 0 (Social Introversion) scores of the Minnesota Multiphasic Personality Inventory according to age, gender, and marital status will not be statistically significant.

Null Hypothesis

1. The difference between Pearson product moment correlation coefficients for the Myers-Briggs Type Indicator Extraversion-Introversion Scale score and the Minnesota Multiphasic Personality Inventory 0 Scale (Social Introversion) score and zero will not be statistically significant.

Definition of Variables

Independent Variables

The following independent variables were investigated: age, gender, and marital status. The rationale for employing these independent variables was:

1. the researcher found nothing pertaining to age and marital status,
2. few published reports were found addressing these 3 variables,
3. these variables were investigated to determine if results were biased toward special groups.

The independent variables were obtained from demographic information on the instruments.

The following independent variables were identified:

1. age -- 2 levels
   level 1, 17 to 29 years old and
   level 2, 30+ years old;
2. gender -- 2 levels
   level 1, male and
   level 2, female;
3. marital status -- 2 levels
   level 1, married and
   level 2, not married.

Dependent Variables

The following were employed as dependent variables:

1. scores from the MBTI Extraversion-Introversion scale, and
2. scores from the MMPI O Scale (Social Introversion).

Limitations

The following conditions might have affected the results of the present study;

1. the sample was not random,
2. small sample size,
3. subjects were from adult education classes of a community college in the Midwest, and
4. all information was self reported.

Methodology

Setting

The setting for this research was two adult education outreach centers of a coeducational community college. The socioeconomic status of this area is basically rural agricultural middle class people with moderate income. This college maintains 28 adult education outreach centers in the 16 counties of northwest Kansas. Adults 18 years old and older who have not completed an associate degree may enroll for classes. Those high school students who have attained status of high school seniors may also take classes for college credit. The enrollment of the community college was approximately 2000 for the academic year 1991-92 with 1000 students attending classes on the campus and approximately 1000 students attending at the various adult education outreach centers.

Subjects

The subjects for this study were students enrolled in 6 introductory courses in psychology at 2 adult education outreach centers in Northwest Kansas during Spring, Summer and Fall semesters from 1990 to 1992. The sample consisted of 84 students, of which 18 were male and 66 were female. Ages varied from 17 to 83 years old.

Instruments

Two instruments were employed. They were the following: The Myers-Briggs Type Indicator (MBTI), and The Minnesota Multiphasic Personality Inventory (MMPI).

Design

A status survey design was employed with predetermined and post hoc groupings. The independent variables investigated were: age, gender, and marital status. The dependent variables investigated were the Myers-Briggs Extraversion-Introversion scale scores and Minnesota Multiphasic Personality Inventory O Scale (Social Introversion) scores.

Two composite null hypotheses were tested employing three-way analysis of variance. A 2 X 2 X 2 factoral design was employed with each of the composite null hypotheses.

One null hypothesis was tested employing a T-test.

Internal Validity

McMillan and Schumacher (1989) identified 10 threats to internal validity. The 10 threats to internal validity were dealt with in the following manner.

1. history - did not pertain because the present study was status survey;
2. selection - all completed instruments were used;
3. statistical regression - the present study did not contain any extreme subjects;
4. testing - did not pertain because the present study was status survey;
5. instrumentation - did not pertain because the present study was status survey;
6. mortality - did not pertain because the present study was status survey;
7. maturation - did not pertain because the present study was status survey;
8. diffusion of treatment - did not pertain because the present study was status survey;
9. experimenter bias - no treatment was administered, and the researcher collected the data according to standard procedures; and
10. statistical conclusion - two mathematical assumptions were violated (random sampling and equal numbers in cells). The lack of equal number in cells was corrected by using a general linear model and the researcher did not project beyond the statistical procedures employed.

External Validity McMillian and Schumacher (1989) identified 2 threats to external validity. The 2 threats to external validity were dealt with in the following manner:

1. population external validity - the sample was not random; therefore, the results of the study should be generalized only to groups similar to the one studied; and
2. ecological external validity - no treatment was administered and the researcher collected the data according to standard procedures.

Data Collection Procedures. The researcher is an adjunct instructor in the Behavioral Science department of a community college. Students in introductory courses of psychology were administered the Myers-Briggs Type Indicator and Minnesota Multiphasic Personality Inventory as class requirements so students could investigate their preferences and psychological interests. Since human subjects were used they were asked to sign a permission sheet (Appendix). The researcher administered the instruments by reading directions from the test manuals. Of the 90 subjects who took both inventories, 84 instruments were complete enough to use. After instruments were hand scored using scoring keys, the researcher completed a data sheet for analysis at the

Fort Hays State University data center.

Research Procedures The following steps were implemented:

1. a topic was selected,
2. electronic searches of ERIC and PsychLIT were completed at the Forsyth Library, Fort Hays State University,
3. the proposal was written,
4. the proposal was defended before a thesis committee,
5. data were compiled from researcher files,
6. data were analyzed,
7. final copy of the thesis was written,
8. thesis was defended before the thesis committee, and
9. final editing of the thesis.

Data analysis

The following were completed:

1. appropriate design statistics,
2. three-way analysis of variance (general linear model),
3. Bonferroni (Dunn) *t*-test for means,
4. Duncan's multiple range test for means,
5. *t*-test for a correlational coefficient.

Results

The purpose of the research was to compare the Myers-Briggs Type Indicator Extraversion-Introversion scale and the Minnesota Multiphasic Personality Inventory O Scale (Social Introversion). The 3 independent variables

investigated were age, gender, and marital status. Dependent variables investigated were scores from the Myers-Briggs Type Indicator Extraversion-Introversion scale and scores from the Minnesota Multiphasic Personality O Scale (Social Introversion). The sample consisted of 84 coeducational community college students in two outreach centers. Two composite null hypotheses were tested employing a Three-way analysis of variance, general linear model. One null hypothesis was tested employing a t-test for a correlation coefficient. Each hypothesis was tested at the .05 level of significance. The following design was employed: for composite null hypothesis number 1, a 2 X 2 X 2 factorial design; composite null hypothesis number 2, a 2 X 2 X 2 factorial design; null hypothesis number 1, a single factor t-test for a correlational coefficient.

The results section was organized according to composite null hypotheses and null hypothesis for ease of reference. Information pertaining to each composite null hypothesis and null hypothesis was presented in a common format for ease of comparison.

It was hypothesized in composite null hypothesis number 1 that the difference between mean Extraversion-Introversion scale scores of the Myers-Briggs

Type Indicator according to age, gender, and marital status would not be statistically significant. Table 1 contains information pertaining to composite null hypothesis number 1. The following were cited in Table 1: variables, group sizes, means, standard deviations, *F* values, and *p* levels.

Table 1; A Comparison of Mean Myers-Briggs Type Indicator Extraversion-Introversion Scores According to Gender, Age, and Marital Status employing a Three-way Analysis of Variance, General Linear Model

Variable	n	M	s	F value	p level
Gender (A)					
Male	18	105.6 *	26.83	0.00	.9721
Female	66	104.0	26.09		
Age (B)					
17-29 years	27	100.1	28.62	0.95	.3325
30 + years	57	106.4	24.81		
Marital Status (C)					
Married	51	106.6	24.58	0.16	.6918
Not Married	33	100.8	28.29		
Interactions					
A X B				0.59	.4430
A X C				0.06	.8052
B X C				0.69	.4084
A X B X C				**	

* Larger scores indicate a greater tendency toward introversion.

** Sample size too small for this statistical analysis.

None of the 6 p values were statistically significant at the .05 level; therefore, the null hypotheses for these comparisons were retained. The results cited in Table 1 indicated no statistical associations between the independent variables and the dependent variable.

It was hypothesized in composite null hypothesis number 2 that the difference between mean Scale O (Social Introversion) scores of the Minnesota Multiphasic Personality Inventory according to age, gender, and marital status would not be statistically significant. Table 2 contains information pertaining to composite null hypothesis number 2. The following were cited in Table 2: variables, group sizes, means, standard deviations, F-values and p levels.

Table 2; A Comparison of Mean Minnesota Multiphasic Personality Inventory Scale 0 (Social Introversion) Scores According to Gender, Age, and Marital Status Employing a Three-way Analysis of Variance, General Linear Model

Variable	n	M	s	F value	p level
Gender (A)					
Male	18	52.1 *	12.62	1.54	.2186
Female	66	54.4	10.67		
Age (B)					
17-29 years	27	52.8	11.22	2.40	.1256
30 + years	57	54.4	11.07		
Marital Status (C)					
Married	51	53.8	11.28	0.14	.7111
Not Married	33	53.9	10.93		
Interactions					
A X B				1.49	.2255
A X C				0.02	.8861
B X C				3.94	.0507
A X B X C				**	

* Larger scores indicate a greater tendency toward introversion.

** Sample size too small for this statistical analysis.

One of the 6 p values was statistically significant at the .05 level; therefore, the null hypothesis for this comparison was rejected. The statistically significant comparison was for the interaction between age and marital status for the dependent variable Minnesota Multiphasic Personality Inventory 0 Scale (Social Introversion). The interaction between age and marital status was depicted in a profile plot. Figure 1 contains mean Minnesota Multiphasic Personality Inventory Scale 0 (Social Introversion) scores and curves for marital status.

Figure 1 The Interaction Between Age and Marital Status for Dependent Variable Minnesota Multiphasic Personality Inventory Scale O (Social Introversion) Scores.

* Sample size of the cell

The interaction between age and marital status for the dependent variable Minnesota Multiphasic Personality Inventory O Scale (Social Introversion) was disordinal. The interaction cited in Figure 1 indicated the following:

1. married subjects ages 17-29 had numerically higher mean Minnesota Multiphasic Personality Inventory O Scale (Social Introversion) scores than those of the same age not married, and
2. not married subjects ages 30+ had numerically higher mean Minnesota Multiphasic Personality Inventory Scale O (Social Introversion) scores than those of the same age married.

It was hypothesized in null hypothesis number 1 that the difference between the Pearson product moment correlation coefficient for the Myers-Briggs Type Indicator Extraversion-Introversion scale scores and the Minnesota Multiphasic Personality Inventory Scale 0 (Social Introversion) scores and zero would not be statistically significant. Information pertaining to null hypothesis number 1 was presented in Table 3. The following were cited in table 3: variables, group sizes, means, standard deviations, and Pearson product moment correlation coefficient, and p level.

Table 3; The Pearson Product Moment Correlation Coefficient Between Myers-Briggs Type Indicator (MBTI) Extraversion-Introversion Scale and Minnesota Multiphasic Personality Inventory (MMPI) Scale O (Social Introversion) Scores compared to zero employing a *t*-test

Variables	*n*	*M*	*s*	*r*	*p* level
MBTI	84	104.3	26.09	.63	.01
MMPI	84	53.9	11.08		

The *p* value for the Pearson product moment correlation coefficient between Myers-Briggs Type Indicator Extraversion-Introversion scores and Minnesota Multiphasic Personality Inventory Scale O (Social Introversion) scores and zero was statistically significant at the .05 level employing a *t*-test; therefore, the null hypothesis for this comparison was rejected. The results cited in Table 3 indicated that the Pearson product moment correlation coefficient between the Myers-Briggs Type Indicator Extraversion-Introversion scale scores and the Minnesota Multiphasic Personality Inventory Scale O (Social Introversion) scores was statistically greater than zero.

Discussion

Summary

The purpose of the researcher was to compare the Myers-Briggs Type Indicator Extraversion-Introversion scale and the Minnesota Multiphasic Personality Inventory O Scale (Social Introversion). The 3 independent variables investigated were age, gender, and marital status. The dependent variables were scores from the Myers-Briggs Type Indicator Extraversion-Introversion scale and scores from the Minnesota Multiphasic Personality Scale O (Social Introversion). The sample consisted of 84 coeducational community college students in two outreach centers. Two composite null hypotheses were tested employing a Three-way analysis of variance general linear model. One null hypothesis was tested employing a *t*-test for a correlation coefficient. Each hypothesis was tested at the .05 level of significance.

A status survey design was employed with predetermined and post hoc groupings. The independent variables were obtained from demographic information on the instruments. A total of 13 comparisons were made. Twelve of the comparisons were from three-way analysis of variance; of these 6 were main effects and 6 were interactions. None of the main effects were statistically

significant. The results indicated no associations between the independent variables and the dependent variables. One of the 6 interactions was statistically significant. The statistically significant interaction was for age and marital status and dependent variable the Minnesota Multiphasic Personality Inventory Scale 0 (Social Introversion) scores. The 13th comparison was a t-test for a Pearson product moment correlation coefficient. The correlation coefficient was .63 and statistically significant at the .05 level.

The related literature and the results of the present study Strickler and Ross (1964) did a correlational study between the Myers-Briggs Type Indicator Extraversion-Introversion scale and the Minnesota Multiphasic Personality Inventory 0 Scale (Social Introversion scale. A Pearson product moment correlation coefficient was calculated between the 2 scales. Strickler and Ross found a correlation of .63 which was statistically significant at the .01 level. The results of the present study replicated the correlation coefficient of Strickler and Ross in that it generated a Pearson product moment correlation of (r=.63.)

McCaulley (1990a) reported significant correlation coefficients ranging from .69 to .79. The results of the present study supported those reported by McCaulley.

Authors opinion pertaining to results

This author formed an opinion that the results obtained from the Myers-Briggs Type Indicator Extraversion-Introversion scale and the results obtained from the Minnesota Multiphasic Personality Inventory 0 Scale (Social Introversion) indicated that either instrument could be used by counselors with persons in a variety of settings. Regardless of which instrument a counselor may choose, approximately the same results from either the Myers-Briggs Type Indicator Extraversion-Introversion scale or the Minnesota Multiphasic Personality Inventory 0 Scale (Social Introversion) scale would be obtained.

This author agrees with the findings Dilley (1987) cited:

> Clients then can assess their preferences, sifting through the various options, and, with the counselor's help, determine for themselves what their innate preferences might be. Used in this way, the MBTI provides a vehicle for self-affirmation, understanding of strengths and weaknesses, and for developing a plan for self-development. (p.48)

Also this researcher found agreement with Dash (1990) when he wrote, "The Myers-Briggs Type Indicator provides adults with self-confirming insights and helps make patterning of human behavior understandable and acceptable. These insights help people make choices, clarify skills, and make decisions affecting work and groups" (p.344).

The correlation coefficient between MBTI Extraversion-Introversion Scale scores and MMPI O Scale (Social Introversion) scores was .63 at the .05 level of significance. This replication of the Strickler and Ross (1964) study indicated that both instruments measure a similar theoretical phenonemon, Jung's construct of Extraversion-Introversion preferences.

Both instruments provided evidence that the preferences of Extraversion-Introversion are consistent with preferences predicted by Jung's postulates. Correlations between the MBTI and the MMPI helped create a bridge for this researcher in understanding Myers-Briggs Preference scores. This researcher concluded, from the related literature, that Jung's theory of psychological types and the Myers-Briggs Type Indicator have moved from relative neglected to broad applications. It is the opinion of this researcher that the Myers-Briggs Type Indicator will remain as an instrument counselors can use

for identifying functions and attitudes that describe human characteristics and attrubutes.

Generalizations

The results of the present study appeared to support the following generalizations:

1. age and marital status should be examined simultraneously when employing Minnesota Multiphaisc Personality Inventory Scale O (Social Introversion) scores;
2. an association was found between Myers-Briggs Type indicator scores and Minnesota Multiphasic Personality Inventory scores;
3. no association was found between age and Myers-Briggs Type Indicator Extraversion-Introversion scores
4. no association was found between gender and Myers-Briggs Type Indicator Extraversion-Introversion Scale scores;
5. no association was found between gender and Minnesota Multiphasic Personality Inventory O Scale (Social Introversion) scores;
6. no association was found between marital status and Myers-Briggs Type Indicator Extraversion-Introversion scale scores; and
7. the two instruments, Myers-Briggs Type Indicator Extraversion-Introversion Scale and Minnesota

Multiphasic Personality Inventory O Scale (Social Introversion) Scale scores, appear to give approximately the same information.

Recommendations

The results of the present study appeared to support the following recommendations:

1. the study should be replicated utilizing a large random sample of college students,
2. the study should be replicated utilizing a large random sample of non-college students, and
3. the study should be replicated utilizing other geographic locations in addition to the Midwest.

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Appendix: Authorization to Use Case Materials in Research, Teaching, or Publishing

Appendix

Authorization to Use Case Materials in Research, Teaching, or Publishing

I sometimes use my work with students as material for research, teaching, supervision, consultation or publishing. For this I might use any of the following:
Notes I have taken during or after our sessions.
Psychological test responses and scores.

When I use materials from my testing or counseling work I do not want anyone who hears, reads or sees it to be able to identify the people involved. Therefore, I would conceal your identity by one or both of these methods:

1. Report the results as grouped data, and so publish only numbers and not names.

2. Remove, or if impossible, greatly change all identifying passages, references, names, dates, places or any other information by which you or any other persons involved could be identified.

All these materials will be used only in a professional manner, kept in a secure location and destroyed as soon as they are no longer needed.

You may withdraw your permission at any time (by informing me, verbally and then by changing this form), and if you do so I will promptly destroy the records made.

I give permission for psychological test scores to be used for educational or research purposes when these criteria are met:

1. They will be treated in a professionally confidential manner.

2. All last names will be removed.

3. They will be shown to only therapy professionals and professional students who are also bound by the same rules concerning confidentiality.

Date: _____
Signature: _____